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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,634	07/01/2003	Kazunari Kimino	R2180.0159/P159	4954

24998 7590 03/25/2005

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EXAMINER
KOCH, GEORGE R

ART UNIT	PAPER NUMBER
1734	

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/609,634	KIMINO	
	Examiner	Art Unit	
	George R. Koch III	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) *12-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 23-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/01/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group III, claims 1-11 and 23-40 in the reply filed on 1/10/2005 is acknowledged.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 31, and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 31 recites the limitation "said discharging mechanism" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. Claim 23 does recite "means for discharging", and for the purposes of examination, it has been assumed that "means for discharging" was intended.

5. Claim 31 recites the limitation "said drive mechanism" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. Claim 23 does recite "drive means", and for the purposes of examination, it has been assumed that "drive means" was intended.

6. Claim 39 recites the limitation "said discharging mechanism" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. Claim 34 does recite

"discharging head", and for the purposes of examination, it has been assumed that "said discharging head" was intended.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 4, 6-8, 10, 11 and 23, 24, 26, 28-30, 32-36, 38 and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Bouras (US Patent 5,906,682).

As to claim 1 and 23, Bouras discloses an apparatus (see Figure 5) for manufacturing a semiconductor device, comprising: a substrate holding unit (lift and lock mechanisms, see column 5, line 4) for holding a semiconductor wafer substrate (i.e., a circuit board with semiconductor elements thereon, see columns 1-2), wherein said semiconductor wafer substrate is provided with at least one electrode formed on a first surface thereof (chip 10, solder balls 12, etc), a discharging mechanism (syringe 20 and dispensing needle 22) for discharging droplets of raw sealant resin (see column 1, lines 15-30) contained in a resin container unit (syringe 20) through at least one discharging nozzle (dispensing needle 22) onto said first surface of said semiconductor wafer substrate held on said substrate holding unit; a drive mechanism (conveyor 38 and XYZ electromechanical positioner 32) for displacing at least one of said semiconductor wafer substrate and said discharging nozzle; and a control unit (items

27, 30, 34 and 40) for controlling said discharging mechanism and said drive mechanism such that said raw sealant resin is attached to said first surface of said semiconductor wafer substrate except at least a portion of said electrode.

As to claim 2 and 24, Bouras is capable of being used wherein said electrode formed on said first surface of said semiconductor wafer substrate is a protruded-shaped electrode, and wherein said control unit is adapted to control said discharging mechanism and said drive mechanism such that said raw sealant resin is attached to said first surface except a tip portion of said protruded-shaped electrode.

As to claim 4 and 26, Bouras discloses that said substrate holding unit is provided with a substrate temperature control mechanism (item 44, 46 and 47, see column 5, lines 32-47) for controlling a temperature of at least said semiconductor wafer substrate.

As to claim 6 and 28, Bouras discloses a heater (item 26, see column 4, lines 19-21) for heating said raw sealant resin contained in said resin container unit.

As to claim 7 and 29, the control unit of Bouras is capable of controlling said discharging mechanism and said drive mechanism such that said raw sealant resin is not attached to at least a portion of dicing lines of said semiconductor wafer substrate.

As to claim 8 and 30, the control unit of Bouras is capable of being adapted to control said discharging mechanism and said drive mechanism such that said raw sealant resin is not attached to dicing lines of said semiconductor wafer substrate and forms a layer with edges of a rounded shape in a vicinity of intersecting points of said dicing lines.

As to claim 10 and 32, the control unit of Bouras is capable of controlling said discharging mechanism and said drive mechanism such that said raw sealant resin is not attached to at least a portion of dicing lines of said semiconductor wafer substrate.

As to claim 11 and 33, the control unit of Bouras is capable of controlling said discharging mechanism and said drive mechanism such that said raw sealant resin is not attached to dicing lines of said semiconductor wafer substrate and forms a layer with edges of a rounded shape in vicinity of intersecting points of said dicing lines.

As for claim 34, Bouras discloses the discharging head (dispensing needle 22), the resin container unit (syringe 20), the drive mechanism (conveyor 38 and XYZ electromechanical positioner 32), and control unit (items 27, 30, 34 and 40) for controlling the discharging head and the drive mechanism. Additionally, Bouras discloses a semiconductor wafer substrate (either of chip 10 or circuit board 16), the semiconductor wafer substrate having at least one electrode (items 12 and 14) on a first surface thereof, and wherein the semiconductor substrate is held in a substrate holding unit (lift and lock mechanisms, see column 5, line 4).

As to claim 35, at least one electrode has a protruded shape (ass seen in Figures 1 and 2).

As to claim 36, Bouras is capable of being used to control said discharging head and said drive mechanism such that the first surface of the semiconductor wafer is covered by said raw sealant resin except a tip portion of said protruded-shaped electrode.

As to claim 38, Bouras discloses a temperature control mechanism for controlling a temperature of at least said semiconductor wafer substrate (items 44, 46, and 47, see column 5, lines 32-47).

As to claim 40, Bouras further discloses that the resin container unit further comprises a heater for heating the raw sealant contained in the resin container unit (item 26, see column 4, lines 19-21).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 3, 5, 25, 27, 31 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouras as applied to claims 1, 23 and 34 above, and further in view of Nakazawa (US 5,935,375).

As to claim 3, 25 and 37, Bouras does not disclose that said discharging mechanism is provided with a plurality of discharging nozzles.

Nakazawa discloses using a discharging mechanism is provided with a plurality of discharging nozzles (see Figures 7A, 7B, 8A, and 8B). Nakazawa discloses that different nozzle sizes can be used in order minimize the differences in the rate of resin dispensing, so that the formation of resin-less voids is deterred (column 4, lines 26-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized multiple nozzles as in Nakazawa in order to avoid resin-less voids.

Furthermore, as to claims 5, 25, and 37, the discharging nozzle of Nakazawa meet the limitation of being two different kinds of discharging mechanisms, heads or means.

As to claim 9 and 31, the control unit of Bouras is capable of said control unit controls said discharging mechanism and said drive mechanism such that a first discharging mechanism of said at least two kinds of discharging mechanisms is capable of discharging droplets of raw sealant resin of an amount smaller than other discharging mechanisms used for discharging said raw sealant resin for an area in a vicinity of said electrode.

12. Claims 5, 9, 27, 31 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouras as applied to claims 1, 23 and 34 above, and further in view of Prentice (US 6,007,631).

As to claim 5, 27, and 39, Bouras does not disclose at least two kinds of discharging mechanisms, heads or means, each being capable of discharging respective different amounts of raw sealant resin.

Prentice discloses at least two kinds of discharging mechanisms, heads or means, (see Figure 5) each being capable of discharging respective different amounts of raw sealant resin. Prentice discloses that such multiple mechanisms allow for parallel processing of the substrates (see abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have two discharging mechanisms in order to achieve parallel processing.

As to claim 9 and 31, the control unit of Bouras is capable of said control unit controls said discharging mechanism and said drive mechanism such that a first discharging mechanism of said at least two kinds of discharging mechanisms is capable of discharging droplets of raw sealant resin of an amount smaller than other discharging mechanisms used for discharging said raw sealant resin for an area in a vicinity of said electrode.

13. Claims 5, 9, 27, 31 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouras as applied to claims 1, 23 and 34 above, and further in view of Cavallaro (US 6,017,392).

As to claim 5, 27, and 29, Bouras does not disclose at least two kinds of discharging mechanisms, heads or means, each being capable of discharging respective different amounts of raw sealant resin.

Cavallaro discloses at least two kinds of discharging mechanisms, heads or means, each being capable of discharging respective different amounts of raw sealant resin. Cavallaro discloses that each mechanism can be connected to or include different types of nozzles and/or dispense different types of liquids (column 2). Cavallaro discloses that this system allows for the assembly to dispense at different locations without it being necessary to move the entire pump assembly every time a dot is dispensed. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have two discharging mechanisms in order to dispense at multiple locations without moving the entire assembly.

As to claim 9 and 31, the control unit of Bouras is capable of said control unit controls said discharging mechanism and said drive mechanism such that a first discharging mechanism of said at least two kinds of discharging mechanisms is capable of discharging droplets of raw sealant resin of an amount smaller than other discharging mechanisms used for discharging said raw sealant resin for an area in a vicinity of said electrode.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-866-377-8642 and giving the operator the above TDD number. The examiner can normally be reached on M-Th 10-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

George R. Koch III
Patent Examiner
Art Unit 1734

GRK
3/21/2005